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USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

No. 88

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19 April 1983

USSR REPORT

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CONSTRUCTION PLANNING AND ECONOMICS

BELORUSSIAN GOSSTROY CHAIRMAN EXPLAINS EXPERIMENT

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 1, Jan 83 pp 53-61

[Article by V. Yevtukh, chairman, BSSR Gosstroy: "Ways of Economizing Resources in Construction"]

[Text] Economization of labor, material, technical, fuel and energy resources is one of the most important problems of the national economy. "Our further movement forward," emphasized L. I. Brezhnev at the 26th CPSU Congress, "will depend to a continually increasing degree on competent and effective use of all available resources--labor, the basic fuels and raw materials, and products of the fields and farms."* It was noted at the party congress that an economic attitude toward the public wealth and the ability to make complete and suitable use of all we have must become the core of today's economic policy. This must be the focal point of the initiative of labor collectives, of mass party work, of technical policy, of capital investment policy and of the system of planning and reporting indicators.

Guiding themselves by decisions of the congress, builders of the Belorussian SSR have begun making more sensible use of productive resources. Measures have been drawn up in the republic to raise the technical level and promote higher productivity of construction in the 11th Five-Year Plan. These measures foresee accelerated introduction of effective, highly prefinished materials and structures, use of progressive mechanized resources, improvement of the system for training and upgrading personnel and improvement of the working and living conditions of laborers. To carry out these tasks, the BSSR Gosstroy developed an integrated program jointly with the republic's interested ministries and departments spelling out the quotas set by the Bulgarian Communist Party Central Committee and the BSSR Council of Ministers, broken down into the individual years of the five-year plan. In this program, additional reserves will be put to use by introducing new, more effective technical concepts. Implementation of these measures should promote an 18 percent increase in labor productivity during the five-year plan, and reduction of the weight of buildings and structures by 4 million tons.

Analysis of the indicators achieved in 1981 would confirm the correctness of the integrated approach to solving the problems associated with raising

* "Materialy XXVI s"yezda KPSS" [Proceedings of the 26th CPSU Congress], Moscow, Politizdat, 1981, p 42.

the effectiveness of construction and improving the results of implemented measures. Negative trends causing growth in labor productivity to decline have been surmounted, an equivalent of 7,000 laborers were freed for other work, and the weight of buildings was reduced by 580,000 tons.

In 1981 the BSSR Gosstroy, Gosplan and Gossnab confirmed the "Basic Directions of Economizing on Construction Materials, Fuels and Energy, and Reducing the Labor-Intensiveness and Estimated Cost of Planned Residential, Civil and Production Facilities in the Belorussian SSR During the 11th Five-Year Plan."

Completion of these tasks will depend to a significant extent on the planning organizations. They are called upon to insure utilization of the achievements of science, technology and the best experience in their plans, to broadly introduce progressive space planning and design concepts and new, effective materials, articles and structures, and to foresee modern job methods. All of this can be done by improving the activities of planning and surveying organizations. It is in this direction that the republic is working.

Collectives of the republic's planning organizations have adopted higher pledges in response to an appeal from the "Gidroyekt" [All-Union Planning, Surveying and Scientific Research Institute imeni S. Ya. Zhuk] to raise the scientific-technical level of plans and to reduce, on this basis, the estimated cost of construction and economize on labor and materials. And by as early as 1981, in addition to fulfilling their previously adopted pledges, the collectives reduced the estimated cost of construction, economized on metals, cement and lumber and reduced labor outlays by 32,000 man-days.

However, the level of the work being done and the results that have been achieved do not as yet fully satisfy the 26th CPSU Congress's demand for thrifty use of labor, material-technical and fuel and energy resources. There are many reserves in this area.

The achievements of scientific-technical progress are not always utilized in the plans that are drawn up. Unsensible design and space planning concepts, obsolete construction procedures and obsolete methods of organizing construction are still being used. When compared with the best plans of similar kinds, a number of plans call for high relative indicators for the outlays of materials, labor, fuel and energy.

One of the reasons for this can be found in the shortcomings within the existing system of planning and evaluating the activities of the main participants of the construction process. The economic mechanism that was introduced into Belorussia as an experiment in the 10th Five-Year Plan, and which was extended to the entire construction sector in the current five-year plan, does not contain adequately effective levers capable of promoting a decrease in consumption of resources in production.. The experience of switching to the new system of settling accounts with clients for finished facilities and evaluating the activities of contracting organizations on the basis of their fulfillment of construction plans has persuaded us that the new valuational indicator does promote faster commissioning of facilities and reduction of

the volume of unfinished construction. This was in fact the main objective of the experiment in the first stage. But this indicator does not have enough influence to reduce outlays of production resources. The reason for this lies in some of the unique features of estimated price forming. The problem lies with the fact that given the same operational properties of a particular facility, the estimated cost of its construction may vary within significant limits depending on the space planning, design and other concepts embodied within the plan.

In contrast to industry, where wholesale prices of products are relatively stable, in construction the estimated cost of a facility is determined as a rule only at the end of the planning stage, and it is essentially a cost-based expression of the outlays on its erection foreseen by the plan.

Contractors today do not have an interest in reducing the "price" of a facility in the planning stage. This is why they are often reluctant to agree to utilize the achievements of science, technology and the best direct experience in their plans with the purpose of reducing the resources that must be consumed to erect the given facilities. After all, an economy of resources achieved owing to utilization of effective space planning and design concepts reduces their indicators, since up to 60 percent of the indicator for construction volume--the main valuational indicator of the work of builders--consists of the cost of the materials. When their consumption is reduced as a result of using more-economical concepts in the plans, the construction volume indicator decreases, and consequently profit and the material incentive fund decrease and other indicators of the construction organizations worsen.

The situation is aggravated by the fact that the planners themselves are often not interested in drawing up a more-economical plan. Utilization of effective designs and space-planning concepts requires greater labor on the part of the specialists, but it is not compensated by either an increase in the reported volume of planning or material incentives.

Many planning organizations feel these problems to be unresolved. An article titled "The Price of a Plan" published on 25 February 1982 in PRAVDA described the work experience of the "Gidroyekt", which initiated, with the approval of the CPSU Central Committee, a drive to economize on manpower and materials by raising the scientific-technical level of plans. This institute as well as other planning organizations face the following problem: How can the initiative of specialists directed at making plans less expensive be confirmed in practice by an effective system of economic stimuli?

Of course, even after a plan is adopted for execution, builders still have a possibility for improving on certain decisions, and on the basis of Clause 45 of The Rules of Contracting Agreements they can claim the resulting savings in the reported construction volume. This would improve the results of their activity. It also influences the savings achieved in the course of construction and installation owing to thrifty expenditure of resources. The brigade contract and the system of material incentives stimulate such savings. However, the existing economic mechanism does not permit sufficiently full utilization of the reserves for reducing outlays of labor and construction

materials to erect buildings and structures. Economic levers which encourage the use of planning concepts that require the use of fewer resources must operate primarily in the planning stage, when the possibilities of introducing scientific-technical achievements are significantly greater. After all, if a facility is already under construction, there would be no time to rewrite the plan. There is also a possibility in the planning stage for making more active use of knowledge possessed on the achievements of science and practice.

Therefore one of the important directions of raising the effectiveness of capital construction is to create conditions under which planners and contractors would have an economic interest in making broad use of the achievements of scientific-technical progress and the best experience in such a way as to reduce the labor and material outlays associated with erecting buildings and structures.

Of interest in this regard is the experience of the GDR, where an effective system of economic stimulation of planners and contractors was placed into operation. The kind of stimulation depends on how much outlays of labor and material resources are reduced. This system is based on stable consolidated prices that remain effective irrespective of which achievements of science and technology and what advanced skills are used in plans. These prices are arrived at on the basis of the consumer cost of construction with a consideration for the operational characteristics of the structure. Estimates of the cost of complexes of construction and installation jobs and of the structural elements of buildings serve as the basis for the consolidated prices.

Contracting organizations involved in residential construction in the GDR settle their accounts with clients for work done on the basis of catalogs of prices on each square meter of housing space in buildings with different numbers of stories offering different conveniences. These prices consist of a base price and surcharges or discounts applied depending on the concrete planning concepts. The base price foresees a standard level of furnishings in apartments. Surcharges or discounts applied to the base price reflect, as an example, presence of loggias or balconies, the type of heating and other features of residential buildings. Today over 90 percent of the housing construction in the GDR is based on such consolidated prices.

Catalogs of comparable prices related to operational units have been drawn up for production facilities. The prices are set per unit volume, area or length depending on the type of building or structure. A "component matrix" is applied to each price, indicating the cost of the basic types of construction and installation jobs and providing price correction factors. The latter are applied when a planned facility differs in its measurements and other characteristics from a representative facility adopted as the model for setting the given price. The most important parameters of such representative facilities are given in the catalog in comparable prices embracing only the construction aspects of the buildings and structures. As is the case with prices on residential buildings, surcharges are also applied to these depending on the territorial location of the facilities, the particular features of the construction site and the particular working conditions of the contractors.

In the most progressive industrial construction combines of the GDR, 60 percent of the total work volume is based on these comparable prices.

Consolidated prices tied in with the consumer value of a structure are drawn up under the guidance of the GDR Ministry of Construction Industry by working groups of experts representing the construction and installation combines. After they are approved by the Department of Prices under the republic's Council of Ministers with the participation of the minister for construction industry and the minister for finance, these prices become the basis for settling accounts between clients and contractors, and they remain effective until their planned review--that is, for a period of not less than 5 years.

After the basic characteristics of facilities to be built and the building costs (based on stable consolidated prices) are agreed upon by the client and contractor, the working plan is drawn up, as a rule by the planning subdivisions of contracting organizations. The blueprints are used to arrive at the estimated cost, based on standard prices on complexes of jobs and structural elements. The estimated cost is the basis for determining the labor and material demand. The more economical the working plans are, the lower are the outlays of these resources, and consequently the lower is the cost of the facility, as estimated from the blueprints.

The savings from applying the achievements of science, technology and the best experience to the plans and to construction itself does not reduce the final price of the structure; on the contrary it becomes a source of additional profit for the contracting organizations. This profit is used for economic stimulation of the collectives of planning and construction subdivisions, and part of it is entered into the state budget.

In the GDR, the objective of raising the effectiveness of construction by applying scientific-technical achievements to the plans is pursued in integration with the following important practices:

promptly informing planners of the deadlines for introducing and the indicators for applying finished scientific research developments;

setting quotas for the planners on reducing the labor and material intensiveness of construction and on raising the consumer value of buildings and structures (these quotas must be satisfied by introducing the achievements of science, technology and the best experience);

evaluating the the work of planners and enlarging their bonuses depending on the improvements they make in planning concepts.

Passports, which became a mandatory element of planning documents beginning with 1975 in the GDR, are now highly important to the conduct of these practices. The passport indicates the scientific-technical achievements that must be applied in the given plan, and the estimated impact these achievements would have on reducing outlays of resources and the cost of the facility. As the plan nears completion, the fact that these requirements have been satisfied is documented. In this way an integrated approach to

evaluating the work of planners is insured, thus promoting an increase in the effectiveness of economic stimulation and socialist competition.

A significant share of the additional profit received by contractors is used to pay bonuses to planners and builders for any savings for which they were responsible. The bonuses are paid in the form a so-called "variable portion of wages," and they may represent up to 50 percent of the basic salary.

This system of economic stimulation of construction planners and workers is promoting a significant decrease in the outlays of labor and material resources. Thus the five-year plan adopted for 1981-1985 by the 10th Congress of the Socialist Unity Party of Germany foresees achieving more than half of the planned increment in construction and installation over the 1980 figures without increasing the quantity of fixed capital while maintaining a 6-7 percent annual increase in labor productivity.

In summer 1981 a group of Belorussian executives visited the GDR and thoroughly studied the experience of our friends. As a result proposals were submitted to the republic's government, particularly on conducting an experiment in the BSSR to reduce outlays of production resources in construction by applying the achievements of science, technology and the best experience in plans and by paying bonuses to the participants of the experiment for any savings they might achieve. Following a careful examination it was deemed suitable to conduct such an experiment in the republic, one based on using stable prices on finished construction that would remain constant over a 5-year period. The estimated cost of facilities established on the basis of these prices would stand firm even after more-economical concepts are introduced into the plans, assuming that they do not worsen the operational properties of the buildings or structures being erected. Stable prices are to be applied not only to accounts with clients but also to the planning and evaluation of the activities of contracting and planning organizations. The savings formed as the difference between the estimated cost of the facility on the basis of stable prices and the actual cost of construction and installation based on the blueprints is to be distributed between the state budget, the planning and contracting organizations and the client, and it is to serve them as a source of bonuses to workers and as a means of covering the outlays connected with preparing scientific-technical achievements for introduction.

The BSSR Gosstroy and the Belorussian affiliate of the USSR Gosstroy's All-Union Scientific Research and Planning Institute of Construction Labor developed draft methodological premises regulating the order of the experiment, with the participation of the interested republic ministries, departments and planning institutes. This documents was approved by the USSR Gosplan interdepartmental commission concerned with applying new methods of planning and economic stimulation.

In accordance with the methodological premises the experiment has been underway since 1982 in planning-surveying, general contracting and subcontracting construction and installation organizations responsible for the planning and

construction of production, housing, civil and other facilities located on Belorussian territory and named on lists approved by the BSSR Gosstroy. These lists include facilities for which the estimated cost was established on the basis of stable prices on construction, or on the basis of their equivalents: price lists, estimates applicable to standard or regularly applied individual plans, estimated prices determined in accordance with the instructions of SN [Construction Norms] 514-79, and approved estimates adopted by contractors prior to 1 July 1981 for individually planned facilities.

Stable prices are defined in relation to the consolidated estimated cost of finished construction of buildings or structures of a particular type, remaining constant until the next review of such prices. The USSR Gosstroy Scientific Research Institute of Construction Economics is now completing its work on instructions for forming and using these prices. According to these instructions, stable price catalogs consist of individual paragraphs describing a particular facility and indicating the estimated cost of finished construction, per unit of measurement. In order that the estimated cost could be corrected in the event of deviations in the parameters of the planned facility from the representative facility adopted as the basis for establishing a stable price, tables of the appropriate correction factors or surcharges and discounts will be provided. Table prices will account for a number of other factors such as, for example, the particular method used in setting estimated prices depending on the departmental subordination of the construction organizations (differences in overhead norms and so on).

The experiment provides a possibility for verifying the suitability of using consolidated estimate norms, information on the estimated cost of analogous facilities, consolidated indicators of construction cost and other information to establish the stable prices on construction. However, we must keep in mind that it takes a long time to create such stable price catalogs. Moreover because the construction sector will be making a transition to new unified estimates, formation of these prices cannot begin until 1984. Therefore the first stage of the experiment will involve: buildings and structures that can be built on the basis of existing price lists or estimates associated with standard or regularly employed plans, tailored to local conditions; facilities for which construction began in 1982 and for which planning and estimate documents had been drawn up, approved and accepted by the general contractor as of 1 July 1981.

So-called estimated prices are being established for other facilities. They are used as an equivalent of stable prices in the first stage of the experiment. Estimated prices are being applied to a limited number of individually planned facilities, the plans of which make use of concepts which far outstrip the attained level of technology. These prices are determined by adding the cost of construction and installation determined by estimates based on the blueprints, and the total savings achieved as a result of applying the achievements of science, technology and the best experience in the plan. The amount of the savings is calculated in accordance with USSR Gosstroy instructions in SN 514-79. Estimated prices are reviewed by a republic state expert commission and approved by the BSSR Gosstroy.

The estimated cost of erecting buildings and structures taking part in the experiment, which is based on stable prices as well as price lists and estimates applicable to standard and regularly employed plans, is calculated in the established order. This estimated cost is used to plan the total volume of construction and to settle accounts with clients.

When drawing up the blueprints, planning organizations must also make special calculations for cases where rationalized planning concepts are used. These calculations are required so that the cost of construction and installation determined on the basis of the working documents could be compared with the cost of finished construction on the basis of stable prices or their equivalents, and so that the savings resulting from applying scientific-technical achievements and the best experience to the plans could be established. According to the methodological premises on conducting this experiment, the savings is determined in relation to the cost of finished construction, standard conditionally net production and all other indicators derived from the former. In order that the total savings enjoyed from a given plan could be distributed between the general contracting and subcontracting organizations participating in the experiment, the compared costs are expanded in such a way that the savings can be represented in relation to the cross section of different complexes of jobs assigned to different construction and installation organizations.

In certain cases where the working documents are amended in the established order in the course of construction (to include corrections made necessary by the appearance of new, more economical concepts and incomplete realization of the achievements of science, technology, and the best experience applied to the plan, and corrections elicited by mistakes discovered in the cost comparison), the savings resulting from applying scientific-technical achievements to the plan must be corrected. The savings achieved in construction and installation jobs is updated as individual structural elements and jobs with which the savings is associated are completed. Outlays on unfinished construction are credited with regard to this savings.

The cost of planning and surveying operations and the indicators of the activities of planning and surveying organizations derived from this cost, and the cost of fixed capital placed into operation are determined on the basis of the cost of the facility under construction, as determined from stable prices or their equivalents. Concurrently, facilities included in the experiment are provided with the required material resources in the established order on the basis of the plans and estimates (on the basis of the cost comparisons made for particular construction territories and facilities). In other words resources are allocated only for the volume of work foreseen by the blueprints.

According to the conditions of the experiment, the savings resulting from application of scientific-technical achievements to the plans are distributed as follows: Twenty-five percent of the savings are entered into the state budget; the same amount is used to compensate for the greater outlays of the contracting organizations associated with introducing the achievements of science, technology and the best experience; the remaining 50 percent are

used to pay bonuses to the participants of the experiment, to include 17.5 percent for the planners, 30 percent for the contractors and 2.5 percent for the clients. In this case the construction and installation organizations are granted the right to transfer part of their bonus funds to construction materials industry and construction industry enterprises that initiated production of new, effective structures and materials used in an improved plan.

Assets intended to compensate for higher outlays associated with introducing the achievements of science, technology and the best experience are used by contracting organizations primarily to cover the costs of preparing for production. They include, as an example, outlays on manufacturing the equipment or teaching workers the new procedures. These assets are also used to cover the expenses of planning carried out with the purpose of making standard and other plans more economical on the basis of direct contracts between contracting organizations or construction departments on one hand and planners on the other (given the appropriate limits).

In principle, the participants of the experiment are paid for the results they achieve after the facility is placed into operation. However, payment of bonuses in advance--in the initial phase of a facility's construction--is foreseen for workers of planning organizations, since for their purposes a plan that is approved and adopted by the contractor is a finished product.

Assets to be used as bonuses to workers who introduce the achievements of science, technology and the best experience and apply them in the plans are entered into the material incentive funds of the appropriate organization. Workers of planning, contracting and other organizations are paid bonuses on the basis of their personal participation in applying scientific-technical achievements to the plans, separately in relation to each facility participating in the experiment.

In order to intensify the stimulatory role of these bonuses the methodological premises foresee their payment within a month of the day the assets enter the material incentive fund as a rule. Of course a contracting organization may not always enter all of these assets into this fund. If a contracting organization fails to make a given facility operational on time and if it fails its profit plan, its bonus fund is reduced by up to 50 percent.

The methodological premises also foresee the client's participation in the experiment. His main task is to see that economical planning concepts do not worsen the operational characteristics of the facility participating in the experiment. Moreover the client must provide assistance to the planning and contracting organization in incorporating within the plans and introducing scientific-technical achievements aimed at reducing the resource cost of construction.

The appropriate organizational efforts are now being made in the republic to support successful conduct of the experiment. A republic conference providing instructions on the experiment was conducted in September 1982. Workers of party and soviet organs and representatives of all ministries, departments

and organizations involved in capital construction attended. Problems associated with conducting the experiment were examined at an expanded meeting of the BSSR Gosstroy, which adopted a decree and confirmed a detailed plan of measures for the 11th Five-Year Plan.

The experiment has already begun. On agreement with contractors, the planning organizations submitted proposals for including more than 300 facilities in the experiment. Following a detailed analysis of their nature, the times for construction to begin and other particulars, the BSSR Gosstroy approved about 130 facilities in this list. Twenty-five planning and surveying institutes and contracting organizations belonging to 10 union, union republic and republic ministries and departments are participating in the first stage of the experiment. The estimated cost of facilities participating in the experiment is more than 160 million rubles. The basic directions of improvement--applying progressive structural and space planning concepts, changing certain production concepts, amending the plans of the construction organizations and other measures--have been determined for each of these facilities. According to tentative calculations the anticipated decrease in estimated cost of this group of facilities may be about 3.5 percent.

An analysis showed that production facilities offer the most significant reserves. As an example the "Belgiprobiosintez" Institute proposed a fundamentally new design for the frame and for the suspension of spraying units in the cooling tower of the Mozyr Nutrient Yeast Plant. The innovations could reduce the estimated cost by 800,000 rubles, or by 21 percent. The "Belgosproyekt" Institute intends to reduce the estimated cost of a laboratory building for the Institute of Advanced Training of Physicians by 120,000 rubles (7.1 percent) by improving the design concepts. A savings totaling 150,000 rubles (14.9 percent) is anticipated from improvements in a plan for an overpass in Gomel planned by the Minsk division of the "PromtransNIIproyekt" Institute.

The USSR Gosplan has now allocated the maximum capital investments to the corresponding planning operations, and the BSSR Gosstroy has refined the work plans of the planning organizations in connection with the experiment and with the need for improving individual plans. Work groups intended to run the experiment have been formed and are now beginning to operate in the construction ministries, departments and planning organizations.

Methodological support to the experiment is being improved. Preparation of a set of instructions on how the accounts and reports of contracting and planning organizations should reflect business operations associated with the experiment is nearing completion. Instructions on how to arrive at stable prices and directives on financing and on the order of signing and financing direct contracts between contracting and planning organizations for revision of planning and estimate documents in connection with the first stage of the experiment are being written as well. Specialists of the BSSR Gosplan, the republic offices of USSR Stroybank and USSR Gosbank, the Belorussian affiliate of the All-Union Scientific Research and Planning Institute of Construction Labor, the USSR Gosstroy Scientific Research Institute of

Construction Economics, the Belorussian State Institute of the National Economy imeni V. V. Kuybyshev and others are participating in the work.

Prompt information on the achievements of science, technology and the best experience is acquiring important significance to the experiment. This is why the republic's scientific research institutes have been given the task of making their developments known to every planning organization, thus permitting broad utilization of these developments in the plans immediately after their completion and experimental testing. The role of the technical administrations of the construction ministries and the appropriate services of the construction organizations is growing. Revealing, selecting and testing scientific achievements and the best Soviet and foreign experience must become one of the most important directions in the activities of the planners.

There is important work to be done in forming the catalogs of stable prices on construction. All of the republic's leading planning institutes will take part in this work. New regionalized estimates to be published in the second half of 1983 will be used to calculate the prices themselves. However, prior to publication of such estimates a certain amount of preparatory work will be done with the purpose of selecting the representative facilities, classifying the former and analyzing technical-economic indicators.

Implementation of the measures described above will promote fulfillment of the decisions of the 26th CPSU Congress and the 29th Congress of the Belorussian Communist Party requiring that we raise the effectiveness of social production by accelerating introduction of the achievements of science, technology and the best experience into construction by intensifying material stimulation of the participants of construction for savings they achieve in production resources and for reducing construction costs on this basis.

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CONSTRUCTION PLANNING AND ECONOMICS

GOSSTROY EXPERT EXAMINES TRENDS IN PRICING POLICIES

Moscow EKONOMIKA STROITEL'STVA in Russian No 1, Jan 83 pp 65-70

[Article by G. M. Khaykin, candidate of economic sciences and department chief of the Scientific Research Institute of Construction Economics of USSR Gosstroy, representing Lesson 14 of a correspondence course for cost estimators: "The Transition to the New Standard Cost Estimates and Prices in Construction: Principles, Peculiarities and Economic Results"]

[Text] The reliability of the estimate of capital investments by sectors and types of production, the stability of value indicators of capital construction plans, the introduction of cost accounting (khozraschet) on the basis of the principle that production should pay for itself and be profitable, and intensifying the stimulative role of economic levers in reduction of the specific consumption of physical, labor and financial resources and in reduction of costs--these tasks are not all on the same scale, nor is it equally important to capital construction and the economy as a whole to perform them in a sound way. But they are all inseparably bound up with the development and improvement of the setting of standard costs and prices.

The methods of determining the estimated cost and the system of prices and pricing in capital construction are instruments whose skillful use has considerable importance to the normal functioning of the sector's entire economic mechanism.

The prospects and directions for refining methods of setting prices of the product of construction are related to the demands of the transition to a qualitatively new stage in the planning and designing of capital construction envisaged by the decrees of the CPSU Central Committee and USSR Council of Ministers entitled "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality" and "On Measures To Further Improve Project Planning and Cost Estimation."

Development of pricing in capital construction is following three main directions in the present stage.

The first direction results from the need to periodically update the system of standard costs and prices so that it reflects most fully the changes taking place in engineering, technology and the organization of the construction

process as well as changes of wholesale prices and rate schedules in industry, programs for delivery of materials and fabrications, and so on.

The updating of the set of standard cost estimates which is now taking place is accompanied by a revision of the estimate norms and prices in effect in construction, the devising of standards that apply to new fabrications and types of operations, to new types of buildings and installations.

The second direction consists of developing and introducing progressive new types of estimate norms and prices that best meet the present-day conditions for development of cost accounting at the different levels of management of construction and the requirements of increasing the reliability of the construction cost.

The work being done in this direction has resulted from the use in planning of fundamentally new indicators--the marketed output of construction and NUCHP [normative conventional net output], the tendency toward ever broader transition to the use of the estimated cost in a new way--in the form of a price for "turnkey" projects.

The third direction being taken by development of pricing is dictated by the ever broader use of the methods of mathematical economics and computers in working out estimate norms and prices and compiling cost estimates, and simulation of the processes of cost norm setting. Using this entire set of tools is an indispensable condition for processing the large volume of project planning, price and statistical information and for solving the interrelated set of optimization problems.

In accordance with Decree No 5 of the USSR Council of Ministers dated 4 January 1981 and entitled "On Transition to New Estimate Norms and Prices in Construction," beginning 1 January 1984 the new estimate norms and prices will be applied in determining construction cost and in planning capital investments. Their introduction is an important step in solving the problem of strengthening the role of economic incentives and instruments in management of the sector.

Work on the transition to the new estimate norms and prices being done by project planning and scientific research institutes of USSR Gosstroy, of the gosstroys of the union republics, and of ministries and departments, as well as by construction organizations, planning agencies and institutions of USSR Stroybank and USSR Gosbank, is divided into two stages.

In the first (it was by and large completed in October 1982) interrelated sets of estimate norms and prices were worked out and approved; as a body they comprise the normative base of pricing in capital construction. They include the element-by-element estimate norms for construction operations--48 collections (more than 16,000 norms), uniform regional unit prices for construction operations--48 collections (more than 30,000 unit prices), unit prices for installation operations--36 collections (about 30,000 unit prices), average regional estimate prices for building materials, products and fabrications (more than 25,000 prices), estimate prices for local building materials, products and

fabrications (more than 80,000 prices), average estimate prices per machine-hour of construction machines, etc. The total number of new standard estimates exceeds 300,000.

A central place in the system of norms and prices which have been developed is occupied by the new Part VI of the SNIIP [Construction Standards and Rules] entitled "Estimate Norms and Rules." The 16 chapters of the Rules contain systematized regulations defining the principles and procedure for working out and applying the entire body of estimate norms and prices as well as procedure for their use in compiling cost estimates.

The standard estimates reflect the present level of development of engineering, technology and the organization of the construction process, the new norms for planning construction projects and manufacturing processes, achievements in recent years in standardization of buildings and installations, standardization of space-layout and structural solutions of buildings and installations, materials, fabrications and equipment.

Thus the result of work done in the first stage has been the updating of the entire body of standard estimates used to determine construction cost and to plan capital investments for the sectors of the economy, the branches of industry and regions.

The second stage of the work involved in the transition to the new estimate norms and prices is their use to convert cost estimates, including summary cost estimates, project estimates and local estimates for sectors of the economy, branches of industry and particular types of purposes within sectors (remainders of the estimated cost of construction sites being carried over and the estimated cost of construction projects to begin in 1984 must be converted by 1 January 1984).

The result of the work in the second stage will be conversion of estimates in accordance with the new norms and prices for the volume of work envisaged by the plan for 1984.

Remainders of the estimated cost of construction and installation work as of 1 January 1984 are converted in summary estimates in simplified form, using indices worked out for the sectors of the economy and the branches of industry. These remainders will be determined according to the amount of work actually done as of 1 January 1983 and according to the plan for 1983.

Remainders of the estimated cost of equipment is to be converted by "direct computation"--on the basis of price lists for the products of machinebuilding which took effect 1 January 1982.

Remainders of the estimated cost of construction and installation work on project estimates and local estimates are converted using the new unit prices and estimate prices. Moreover, for projects to be completed in 1984 the remainders are to be determined according to the actual performance of work as of 1 January 1983 and according to the plan for 1983.

In order to compute with greater reliability remainders of the estimated cost of construction and installation work at projects to be completed in 1985 and subsequent years for which the documentation was compiled according to 1969 estimate norms and prices, the figures on actual performance of work as of 1 January 1984 will be used to convert them. The actual conversion will be done in the first quarter of 1984.

It is a basic peculiarity of the set of operations involved in compiling the new estimate norms and prices and conversion of estimates in accordance with them that the transition to the new body of standard estimates is to be made without losses to the state budget. This means that on the one hand the size of the change of the estimated cost of construction resulting from introduction of the new estimate norms and prices should be organically linked to the level of change of wholesale prices and rate schedules in industry as of 1 January 1982, and on the other when the estimates are converted there are to be no changes whatsoever that are not related to introduction of the new estimate norms and prices.

So, the following principles have been set down as the basis for working out the new estimate norms and prices in construction:

- i. the estimate norms and prices had to reliably reflect the new wholesale prices and rate schedules for industrial products, the present level of development of engineering, technology and the organization of the construction process, the present makeup of cooperative relations between construction and the branches of industry and transportation supplying physical and technical resources and rendering services;
- ii. there was a need to ensure that estimate norms and prices play a greater role as an incentive for raising the efficiency of construction and for all-out conservation of physical, labor and financial resources;
- iii. organic linkage had to be achieved between the system of estimate norms and prices being created and the requirements of the transition to the new methods of planning and evaluation of performance of construction contractors;
- iv. application of the new estimate norms and prices is called upon to promote simplification of the methods of compiling cost estimates and at the same time raise the level of their reliability, as a necessary condition for ensuring internal consistency and stability of plans for capital construction and improvement of its technical-and-economic indicators.

Along with the general principles which apply to devising the estimate norms and prices, the methods and the mechanism for working out specific types of standard rates, because of their functional purpose, the place which they occupy in the system of estimate norms, and the specific nature of their application, have their own distinguishing peculiarities.

The methods of determining estimate prices for building materials, products and fabrications are typical in this regard. About 60 percent of the estimated cost of construction and installation work goes for materials. That is

why the justifiability of the figures on the estimated construction cost of enterprises, buildings and installations depends in large part on the reliability of the estimate prices for them. At the same time the costs of materials are probably first to reflect changes taking place under the impact of scientific-technical progress both within construction and also in the branches of industry. As those changes grow larger when the estimate prices remain unchanged over a rather lengthy period (up to 15 years), this affects the profitability of the construction process and thus is a warning signal that once again there is a need to update the norms.

The estimate prices which took effect as of 1 January 1969 took into account wholesale prices and rate schedules adopted in 1967. In the years that have passed wholesale prices have been revised for a number of physical resources consumed in construction (reinforced concrete products, brick, rolled products of ferrous metals, etc.). New rate schedules have also been introduced for rail and maritime freight transport. Because of specialization of production at enterprises in the industry making building materials and fabrications, in many regions of the country "transportation runs" for delivery of products to construction sites have become longer. Added to this is that the volume of construction in rural localities has increased everywhere and capital investments have grown in Kazakhstan, Siberia, the Far East and the Far North. The scale of capital construction and progressive changes in the technology and organization of the construction process have made cooperative relationships between construction contractors and suppliers of physical resources more complicated. During the last decade there was a constant increase in the share of supplies and fabrications whose delivery to construction involved the use of warehouses and depots of regional agencies of USSR Gosstnab and ministries and departments. Under the impact of all these factors the level of actual costs for many types of physical resources by the time they reach the warehouse at the construction site adjoining the actual project has exceeded the proportion assumed in the 1969 estimate prices. Up to a certain limit this difference has been taken into account in the plans for profit of construction contractors. But beginning in 1976 the profitability of construction and installation work began a steady decline in most construction ministries, and this, along with the price-forming factors noted above, reflected serious shortcomings in organizing the construction process and use of productive capital.

Under these conditions it was deemed advisable to reimburse from the resources of the state budget certain construction ministries (USSR Minstroy [Ministry of Construction], USSR Minpromstroy [Ministry of Industrial Construction], USSR Minsel'stroy [Ministry of Rural Construction] and Minvostokstroy [Ministry of Construction in the Far East and Transbaykal Regions]) their higher costs related to current changes of wholesale prices and the conditions and distances for shipment of the materials.

Thus by the outset of the eighties a situation had come about in which the estimate prices for materials and fabrications had in many cases ceased to correspond to the costs of construction contractors to acquire them and deliver them to construction sites. The costs turned out to be approximately 4-6 percent higher than the estimate prices of materials. In connection with the

introduction of new wholesale prices and rate schedules in industry as of 1 January 1982, this difference increased more than fourfold, making it indispensable to revise the estimate norms and prices across the board.

The estimate norms and prices to be introduced in 1984 have taken into account new wholesale prices and rate schedules for industrial products and services.

The table below shows the dynamic pattern of wholesale prices of the principal building materials, products and fabrications as of 1 January 1982 (by comparison with wholesale prices adopted in the 1969 estimate prices).

<u>Designations of Materials and Fabrications</u>	<u>Proportion of Change, %</u>
Reinforced-concrete products	29.0
Concrete products	33.0
Commercial concrete	9.0
Bricks	42.0
Gravel	12.5
Reinforcing steel for cast-in-place construction	38.0
Steel fabrications	31.0
Cement	13.0
Timber	44.0
Lumber	35.0
Parquet flooring	51.0
Window units	40.0
Door units	13.0
Linoleum	21.0
Glass	19.0

As we see from the figures in the table, the level of wholesale prices has risen 29 percent on the average. We must note that the wholesale price levels taken into account in the estimate prices of the respective years (1969 and 1984) were taken as the objects of comparison, which is why the figures given differ from the figures published by USSR Goskomtsen [State Committee for Prices] and the state committees of the union republics. The latter figures show the proportions of change of wholesale prices which took effect 1 January 1982 as compared to the wholesale prices in effect before 1 January 1982. In this case the objects of comparison are different, as are the figures for the change of wholesale prices as a consequence.

A sound assessment of the changes which have taken place has great practical importance in guaranteeing the internal consistency of figures reflecting the proportion of the change of proceeds and costs of manufacturers and consumers of industrial products.

The new estimate prices for supplies, products and fabrications have taken into account not only the new wholesale prices, but also the conditions and distances which have come about in the eighties for delivery of materials by economic regions, union republics, krais and oblasts, including changes which have taken place in the concentration and specialization of production, in the location of construction sites--primarily under the impact of the larger volume of construction in rural localities and also as a result of the increased

share of capital investments in Kazakhstan, Siberia, the Far East and the Far North. The makeup of physical resources based on extensive use of the network of warehouses and depots of regional agencies of USSR Gosstrib and ministries and departments, and also the depots and warehouses of administrations for aggregate makeup of production technology of construction contractors, which has come about over the last 10 years, was also taken into account.

There is great scientific and practical importance to the economics of capital construction and the economy as a whole that the new estimate prices of materials reflect the changes which have taken place in wholesale prices and transportation programs so as to take into account the real conditions for supplying physical resources to construction.

The economic results of the transition to the new estimate norms and prices on the scale of the national economy lie in the fact that more reliable estimation of capital investments is ensured on the basis of exclusion (or minimization) of the distorted influence of the outdated estimate norms and prices on the composition of capital investments in value terms. This has particular importance to sound selection of directions for commitment of capital investments, for determination of priority in investment projects by sectors, by branches of industry and by purposes within sectors and branches, for solving problems of increasing the efficiency of capital investments, for correct determination of the value of fixed capital put into circulation in the national economy, and ultimately for evaluation of the entire system of economic indicators characterizing economic development.

The economic results of the transition to the new estimate norms and prices on the scale of a sector or branch are manifested above all in a strengthening of the stimulative role of the standard estimates and the creation of conditions conducive to an increase in the profitability of construction contractors.

The dynamic pattern of profitability indicators for the sector as a whole (for construction contractors, not including miscellaneous operations and costs and capital repairs) is characterized by the following figures: 11.53 percent in 1975, 10.13 in 1976, 9.7 in 1977, 8.14 in 1978, 6.61 in 1979, 6.04 in 1980, and 5.95 percent in 1981.

One of the reasons for the drop in profitability, as noted above, is the influence of current changes of wholesale prices and rate schedules. However, as the calculations show, price-forming factors affect no more than one-third of the entire amount of reduction of the profitability of construction and installation work over the period since 1975. The rest is attributed to factors within the construction process itself--the rise of production costs because of nonfulfillment of plans for activation of projects and production capacity and nonfulfillment of targets for the rise of labor productivity; the rise in the level of unproductive costs, the increase in the volume of unplanned work, and so on. That is why it would be an oversimplification to conclude that the transition to the new estimate norms and prices in and of itself automatically will raise the profitability of construction contractors to a normal level. Achievement of that goal means raising the efficiency of the construction process through all-out conservation of physical, labor and financial resources

and utilization of internal potential. Only on that basis, along with application of the new estimate norms and prices, is it possible to guarantee consistent realization of the self-paying principle in all segments of construction work.

Reducing the cost of construction and installation work will become especially urgent when the system of new estimate norms takes effect on 1 January 1984, including the element-by-element estimate norms on structural fabrications and construction operations and the norms and unit prices for installation of manufacturing equipment. These norms have been compiled to take into account the present level of engineering, technology and organization of the construction process and assume a reduction of specific costs by comparison with the estimate norms in effect. As a result of application of the new norms the estimated cost of construction work should drop on the average by at least 1.64 percent (in comparable prices).

Adoption of the new estimate norms will tend to some extent to offset the cost-raising influence on the estimate of capital investments exerted by the new wholesale prices and rate schedules for freight shipments and other price-forming factors which form outside the sphere of construction. This is an important circumstance, one that characterizes the contribution of capital construction to raising the efficiency of social production.

A number of fundamentally new solutions as to methods have been realized in the process of devising the new set of estimates and standards: both in evaluating shipping costs in estimate prices of materials (in that the problem was solved of projecting schemes for the delivery of materials so that the schemes would be both realistic and economical) and also in determining the regions where the estimate prices would be in effect, and again in working out the universally compulsory estimate prices and uniform unit prices for the regions of the Far North and equivalent localities, where departmental standards were previously used, and so on.

An important peculiarity of the new estimate norms and unit prices lies in the fact that preference was given in determining them to determination of figures on consumption of physical, labor and financial resources oriented toward the final results of production regardless of the way in which work is done and the types of construction equipment used.

Developing and approving the package of the new documents on methods and the standards themselves is an important step in qualitative improvement of the system of price setting in construction. Particular attention has been paid here to ever broader use of list prices for buildings and installations, of consolidated estimate norms and consolidated indicators of construction cost. The evolution and development of list prices and consolidated standards are organically bound up with transition to planning and assessing the performance of construction contractors with the indicator of the marketed construction product.

Great importance has been paid to improving the value structure of the indicator of the marketed construction product by using more effective types of

estimate norms and prices. To that end the estimate prices at one level will be in effect over a broader area and will be used for settlement for delivery of local materials and products at prices which include delivery to the construction site (LaSSR, ESSR, MSSR, ArSSR, UzSSR, LiSSR, Moscow Oblast, Karel ASSR, etc.) As is evidenced by many years of experience, the use of these prices in construction makes it possible to solve a number of economic problems at the same time: to guarantee optimum enlargement of the areas of validity of estimate prices reflecting the conditions for regional differentiation of socially necessary expenditures of labor, to strengthen cost accounting of construction contractors by offsetting the distortive influence of changes in shipping costs on the profitability of construction work, and to achieve a saving on shipping costs.

In a number of regions (Vladimir, Kaluga, Pskov, Chelyabinsk and Omsk Oblasts in RSFSR, oblasts in UkSSR and BSSR, etc.) the transition is being made to oblast-based estimate prices. They make it possible to determine the value of construction and installation work in all zones of the oblast at estimate prices which take into account the average level of shipping costs. The differences in costs of delivery of materials to other zones of the oblast (as compared to those assumed in the base estimate prices) is taken into account in a simplified way, in percentages of the total indicator of the estimated cost of operations, without having to devise a duplicate list of estimate prices for the complete list of materials for the oblast's numerous zones.

Transition to use of the new types of estimate prices for local materials and products is an important step toward qualitative improvement and substantial simplification of the set of standards used for the setting of prices in construction.

Within the estimate norms which are to take effect in 1984, as an integral part of them, the indicators of the NUCHP, which have been worked out as average sectorwide indicators, have been separately distinguished. Use of the NUCHP to plan labor productivity in the wage fund is expected to play an important role in reducing the materials intensiveness of construction and in stimulating technical progress on the basis of more reliable assessment of the specific contribution of the collective of every construction contractor to attainment of the final result from the standpoint of the national economy.

The gradual transition to the new procedure for setting allowances on overhead in construction has particular importance: the estimate size of the basic wage fund of workers and operating costs of construction machines is taken as the basis for computing those costs. This is one of the typical examples of how just one change in the method of norm setting transforms the estimate norm into a vigorous instrument exerting pressure on the process of construction work, since materials intensiveness ceases to influence the amount of funds obtained by means of this standard. The indicator of the NUCHP is accordingly formed more soundly thanks to being "divested" of that portion representing expenditures of past labor.

The transition to broad use of the new and more effective types of estimate norms is conducive to improving the economic soundness of prices of the

construction product as an important instrument for reliable estimation of capital investments, for raising the profitability of construction contractors, for introducing cost accounting at all levels of management of construction, for reducing costs per unit of the construction product, and for raising the efficiency of capital investments.

But there is much that still needs to be done to implement the requirements on cost estimation arising out of the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Measures To Further Improve Project Planning and Cost Estimation." The main thing is to bring the methods and forms of standard costing and price setting into full conformity with the requirements of the transition of capital construction to an intensive development strategy and of raising the level of planning work in the sector.

Under present conditions the system of estimate norms and prices must be oriented to a greater degree toward the finished construction product, must be more flexible and dynamic, and, while performing specific functions which belong to it alone, it must vigorously interact with the other economic levers--finances, credit and profit--and be organically linked to planning, which is the central link in planning production.

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[Article by V. A. Alekseyev, deputy chairman of USSR Gosstroy: "Project Planning--An Important Area of the Drive To Increase the Efficiency of Capital Consumption"]

[Text] The 26th congress of our party and the November (1982) Plenum of the CPSU Central Committee have set the country's national economy large and crucial tasks.

The main thing, it was emphasized in the speech of Comrade Yu. V. Andropov, general secretary of the CPSU Central Committee, at the plenum, is to speed up the effort to improve the entire sphere of guidance of the economy--management, planning, and the economic mechanism.

One of the central tasks of the national economy is establishing order in capital construction. This means that a determined struggle must be waged against the squandering of energies and resources over a large number of projects and to achieve an increase in the share of reconstruction and modernization, reduction of the number of new construction sites, and improvement of the organization of the construction industry.

A responsible role in increasing the efficiency of capital construction belongs to project planning--which is its most important link and the conductor of scientific-technical progress and technical and economic policy.

Practical implementation of the nationwide, sectorwide and regional programs of economic construction called for in plans of the country's economic and social development begins with the drafting of project plans. The technical and economic level of the projects built, the progressiveness of the products they produce, the level of industrialization of construction, reduction of construction time, reduction of materials intensiveness and labor intensiveness, optimum utilization of resources and, ultimately, the efficiency of capital investments depend directly on the quality of project plans.

The quality of project planning solutions has a direct impact on working out the indicators of branchwide and national economic plans. Their balance and stability are largely determined by the reliability of the estimated cost of construction.

The ways of further improving project planning and cost estimation have been straightforwardly stated in the decree adopted by the CPSU Central Committee and USSR Council of Ministers in March 1981. The broad range of measures outlined in it were discussed at the All-Union Conference of Personnel of Project Planning and Surveying Organizations, which was held in Moscow at the end of 1981. These measures embrace all levels of work--from general supervision of project planning by USSR Gosstroy to the drafting of project plans and estimates by project planning and surveying organizations.

USSR Gosstroy has now by and large completed the revision and improvement of the set of norms and methodology for improving the quality of project planning to meet the requirements of the decree, has issued the basic regulations on project planning for all sectors of the economy, all branches of industry and all types of construction. The new materials on standards and methods were put into effect in order to substantially reduce the time required for the preparation, clearance and approval of project plans and estimates and, in particular, to reduce the amount of documentation submitted for expert evaluation and approval. Broader incentives have been instituted for designing projects in one stage, and provision has also been made for standardization of project planning solutions and the use of standard project plans.

Further elaboration of the specialization of project planning and the drafting of separate sections of the project plans of large and complicated projects by specialized project planning organizations will help to improve the quality of project planning. At the same time the role and responsibility of the general project planner for the quality of the project plan as a whole and for linking together all its sections and design features have increased.

Regulations have been issued governing the responsibility of customers and heads of project planning organizations for adherence to the approved technical-and-economic indicators of projects when they prepare the working plans and in construction, for the quality and promptness of preparation of project plans and estimates, for their completeness, for incorporating changes in them promptly in accordance with the findings of the expert evaluation, and for the correctness and reliability of the determination of the construction cost.

Other normative documents and documents on methods issued by USSR Gosstroy are also aimed toward the drafting of project plans that meet the high requirements not only of the present day, but also of tomorrow, toward speeding up application of the advances of science and technology, and toward economical and thrifty use of resources.

Further improvement of the organization of the construction catalogue service, revision of regional catalogues of standard structural fabrications for industrial, agricultural, housing, and public works construction, and reduction in those catalogues of the list of fabrications and products to be applied and manufactured in the given region and at specific enterprises of the construction industry are also contributing to the faster application of the advances of science and technology. This will make it possible to organize the manufacture of the most effective product with a high level of off-site readiness, promoting a reduction of labor expenditures at construction sites. That same

goal is served by the albums that have been drafted and published of working drawings of standard structural fabrications, parts and assemblies and the measures outlined to improve the system of information of project planning and surveying organizations concerning the advances of science and technology in the field of production technology, equipment for automating operations, production scheduling and process control, and advanced construction methods.

The greatly simplified project planning procedure and considerable consolidation of project studies, with emphasis on the most important and fundamental solutions, necessitate building up and systematizing a data bank on projects which have been designed and built. Passports of project plans and working drawings, which are an inseparable part of them according to the requirements of the Instruction of Construction Norm 202-81, should serve that purpose.

At the present time USSR Gosstroy has now organized work on information contained in the passports of project plans approved by USSR Ministries and departments and councils of ministers of union republics. This work will be carried on using computers. The result should create an opportunity for determining on the basis of an extensive data bank the most effective technical-and-economic indicator, to solve the problems of improving standard project planning, the setting of technical standards, to work out consolidated indicators of the estimated cost of projects, etc. Work is also being done to computerize information for its use in expert evaluation of projects. Creation of the sectorwide data base should become one of the principal tasks of ministries, department and union republics.

For purposes of conducting a uniform technical policy in capital construction, of eliminating departmentalism and localism in settling issues of project planning and project construction, on behalf of their most optimum location, economical expenditure of physical and energy resources, environmental protection and improvement of the quality of project planning, USSR Gosstroy, jointly with USSR Gosplan, is carrying out measures aimed at improving the network of project planning organizations and the organizational structure for the management of project planning. Regional project planning institutes of USSR Gosstroy have been given quite an important role in solving these problems. They are to become the conductors of its technical policy, are to provide leadership as to methods and organization for project planning organizations located in the zone of their activity, and to exert a vigorous influence toward the quality of preparation of documentation. This is precisely the purpose of the new revised regulation on regional project planning and surveying organizations which has been approved by USSR Gosstroy. The system of regional organizations will continue to be improved in the future.

Thus the basic prerequisites have been created as to organization and method for a determined change of the state of affairs, for achieving a rise in the efficiency of capital investments, for practical application of scientific-technical advances and resource-saving and natural-conservation measures, for a high level of technical-and-economic indicators of enterprises, buildings and installations to which project plans apply, for improvement of three-dimensional, layout, architectural and construction features, and for substantial reduction of the time and money spent on project planning.

USSR Gosstroy has outlined and is implementing additional measures aimed at faster realization of the principles contained in the decree of the CPSU Central Committee and USSR Council of Ministers on further improvement of project planning and cost estimation and the demands contained in normative documents and directives. Fulfillment of the measures outlined to improve project planning and cost estimation is being followed up more vigorously, spot checking of the quality with which project plans and estimates are prepared in the branches of industry and sectors of the economy has been considerably expanded, and requirements have been tightened for correcting shortcomings and for a further rise of the scientific-technical level of the project plans produced.

More concentrated efforts of ministries, departments and their subordinate project planning organizations are required to implement everything that has been outlined and to sharply improve the quality of project plans and the reliability of determination of the estimated cost of construction. There is a need for persistent and purposive restructuring of the effort to obtain high final results.

But this reorganization is not being carried out vigorously enough at present, and in certain cases it is essentially a formality. Decisive measures have not yet been taken to speed up application of scientific-technical advances, and the monitoring of the activity of subordinate project planning organizations by ministries and departments has not been raised to the level it deserves. Revision of sectorwide normative documents and development of the system of unit indicators of the cost and materials intensiveness of projects have gone slowly, and the bodies for expert evaluation have so far not been strengthened.

Checks conducted by USSR Gosstroy indicate the need for closer supervision by ministries and departments over the conduct in the sectors of the economy and branches of industry of the uniform technical and economic policy in capital construction and over stewardly and thrifty use of resources in project planning.

In project plans examined by Glavgosekspertiza [State Experts Main Administration] of USSR Gosstroy in 1981 and the first half of 1982 alone a possibility was found of reducing costs and the amount of work by 1.8 billion rubles by improving the project planning features and correcting errors in the cost estimates, to reduce consumption of metal by 171,000 tons, including reduction of the consumption of metal pipe by 48,000 tons, and to reduce fuel and energy resources by 3.7 million tons of standard fuel. At the same time it was found necessary to include in the estimate projects and costs which had been omitted in the total amount of 800 million rubles. And this in projects which had gone through departmental expert evaluation and in most cases already had been approved.

In 1981 and the first half of 1982 about 30 percent of the project plans included in spot checks were returned for additional work to ministries, departments and councils of ministers of union republics. There was an exception in the project plans only of certain ministries such as USSR Minenergo [Ministry

of Power and Electrification], USSR Minlesbumprom [Ministry of Timber, Pulp and Paper, and Wood Processing Industry], Mingazprom [Ministry of Gas Industry], where measures have consistently been taken to improve project planning and cost estimation. For most other ministries, especially the machinebuilding ministries, a large portion of project plans and estimates which have been checked were regularly returned for additional work and reapproval.

Not uncommonly there are violations of the established procedure for revision of project plans and reapproval of project plans and estimates, yet those guilty of this go unpunished.

Quite a few project plans are still being approved with low enterprise capacity, unwise three-dimensional, layout and design features, manufacturing processes and equipment which are not progressive, and insufficient study of the questions of environmental protection and economical use of resources. Oversights are permitted in determination of the construction cost.

USSR ministries and departments and councils of ministers of union republics are called upon to pay particular attention to this important indicator. Errors in determining the construction cost must now be regarded as a flagrant violation of state discipline.

Because of slack supervision over adherence to the approved estimated cost during construction and numerous departures in the process of preparing working drawings from the approved design features project plans are still being revised in the direction of less favorable technical-and-economic indicators. According to the data of the Department of Standard Costs and Pricing in Construction of USSR Gosstroy, USSR Minpishcheprom [Ministry of Food Industry], for example, revised 13 project plans, and as a result the estimated construction cost rose 35.4 million rubles, or 9.5 percent; USSR Minstroyaterialov [Ministry of Construction Materials] revised 29 project plans, increasing the estimated cost by 156.2 million rubles, or 19 percent. The figures are similar for USSR Minsel'khos [Ministry of Agriculture]: 75 projects and 103.3 million rubles, or 10.2 percent; and for Minudobreniy [Ministry of Fertilizer Industry]: 3 project plans and 90.1 million rubles, or 21 percent.

Progressive domestic and foreign experience in project planning convincingly proves that improvement of production technology and equipment have a decisive impact toward higher efficiency of capital investments, reduction of the specific consumption of raw materials, supplies, and energy resources, both in construction and also in the actual operation of the project.

In all that we have said the problem of faster application of the advances of scientific-technical progress through project plans naturally should be put in first place. At the November (1982) Plenum of the CPSU Central Committee it was emphasized that in order to effectively advance the cause of application of new technology and new work procedures there is a need not simply to popularize them, but also to identify and correct the specific difficulties which are standing in the way of scientific-technical progress.

The close relation of project planning with science is a most important condition for raising the scientific-technical level of design features and for their further improvement. There is a need to speed up the transition to combine program methods and target methods of operation in order to speed up the application of scientific-technical advances through project plans, to reduce the time operations require over the entire cycle "science--production," and to obtain the maximum return from new scientific and technical developments. There is a need for radical improvement of the coordination and planning of these operations, to invigorate the activity of participants in carrying out these comprehensive target programs, and to increase their responsibility and interest in high final results. The ways of achieving the goal have been defined in the decree of the CPSU Central Committee and USSR Council of Ministers on improvement of the economic mechanism. There is a need to be more persistent and purposive in solving this problem.

Given the present scale of capital construction and the immeasurably more complicated production and economic relations among branches and enterprises, and as the economy makes the transition to the intensive strategy of development, the shaping of the construction program and the designing of specific projects must be based on the prospects for development of science and technology and for the country's sectors and regions.

Every project plan prepared and approved should become an indispensable link in the overall program for development of the branch or sector and should strictly correspond to the technical and economic policy which has been outlined. This task can be performed on the basis of charts for development and location of the sectors of the economy and branches of industry, charts for development and location of the productive forces by economic regions and union republics. The drafting of these documents, which is already being done by USSR ministries and departments and councils of ministers of union republics according to a method approved by USSR Gosplan, demands the most fixed attention. Everything necessary should be done so that materials substantiating the needs of all new construction projects planned and all enterprises which need to undergo reconstruction and expansion are included in these charts for the coming 5-year period. Moreover, the principal indicators of the projects, including the cost of their construction, should be determined. As a result opportunities will be created for sounder shaping of the list of new construction starts and the list of project plans which should be prepared in the 5-year period covered by the plan.

Pursuant to the decree of the CPSU Central Committee and USSR Council of Ministers on further improvement of project planning and cost estimation, the principal indicators, including also the value of construction projects indicated in the list, may not be revised to less favorable figures when project plans and estimates are prepared. This requirement has to be observed unswervingly, and there should be strict monitoring of its fulfillment. Only in this way is it possible to block the way to the squandering of capital investments, to the lengthening of construction time, to extinction of the period for application of scientific-technical advances and progressive structural solutions, and to reduction of the efficiency of the construction process.

As already noted, the basic directions for the project planning of enterprises, buildings and installations with progressive specific indicators of materials intensiveness for construction projects and plans for raising the technical level of sectors and branches represent an important instrument for raising the technical and economic level of design features. Yet so far these plans have not yet become a reflection of the basic directions of project planning at each specific construction site; project planning and scientific research organizations are still not being assigned to targets for use of scientific-technical advances in development of technology and in creating equipment, structural fabrications and new materials.

Particular responsibility lies on ministries for conducting a uniform technical and economic policy in sectors and branches in the preparation and approval of assignments for preparation of project plans. Ministries and organizations which are the customers of project plans are expected to pay more attention to application of new technology and advanced know-how, to indicators of the efficiency of capital investments, to reduction of material-and-labor intensiveness of construction, and to the rise of labor productivity, and to assign project planners relevant targets for each project plan being prepared. Fulfillment of all these requirements and the progressiveness of the indicators outlined in assignments for project planning and of the technology proposed for application must be subject to strict monitoring and evaluation by the expert evaluation of ministries and departments.

At the present time USSR Stroybank and its local financing institutions are monitoring more strictly enforcement of discipline with respect to project plans, cost estimates and finances, and they are pronouncing rather severe penalties in the necessary cases. This has even now become a barrier to certain exaggerated liberties of project planning organizations and ministries. Financial penalties for the low quality of project plans will now be invoked on representation of the expert evaluation of USSR Gosstroy and the gosstroys of the union republics as well.

It is a concern of all entities concerned in one way or another with the affairs of project planning to set up a strong barrier to all sorts of violations of normative requirements, to departmentalism and localism, which are harmful to the interests of the entire state and the entire people, and to bar the way to project plans and estimates of low quality. Every project plan recommended for approval must be in line with the basic directions of development and location of the branches of industry and sectors of the economy and the productive forces.

The entire reorganization of project planning and cost estimation now being carried out is aimed at performing the principal task facing project planning, which is to ensure that project plans embody the advances of science, technology and progressive domestic and foreign know-how, to see that the enterprises built or undergoing reconstruction are technically advanced at the time when they are put into operation and produce a high-quality product in accordance with scientifically sound norms with respect to inputs of labor, raw materials and supplies.

All efforts of USSR Gosstroy, ministries, departments, councils of ministers of union republics, bodies for expert evaluation, and project planning and surveying organizations must be concentrated along this key direction, strictly following the decisions of the November (1982) Plenum of the CPSU Central Committee, if there is to be success.

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CONSTRUCTION PLANNING AND ECONOMICS

NORM REVISION TO IMPROVE PERFORMANCE DISCUSSED

Moscow BETON I ZHELEZOBETON in Russian No 2, Feb 83 pp 2-3

[Article by D. A. Pan'kovskiy, deputy chairman of USSR Gosstroy: "An Important Condition for Speeding up Technical Progress in Construction"]

[Text] The 26th CPSU Congress set the task of achieving radical improvement in the state of affairs in capital construction, of raising its efficiency in every way, of reducing materials intensiveness, and of constantly refining the management of construction. At the November (1982) Plenum of the CPSU Central Committee it was also noted that there are still many problems unsolved in capital construction. To be specific, the results of scientific-technical development projects need to be applied in practice more resolutely.

A faster pace of technical progress in construction is closely bound up with improvement of technical norm setting. The system of normative documents in the construction sector that is now in effect in our country includes 750 statewide, 70 sectorwide and 500 republic standards, 250 construction norms and rules, as well as other normative documents.

State standards now govern the production of 95 percent of all the cement produced, 90 percent of the ceramic and asbestos-cement products, the entire volume of porous fillers, nonmetallic minerals, wall materials and other construction materials. Practically all the project planning and construction in the country is done according to normative documents which are part of the system.

The normative documents reflect the present level of scientific research and progressive know-how in project planning and construction work. Most of them are equal to the norms of foreign countries which are technically advanced and exceed them with respect to a number of indicators. Compliance with the requirements of normative documents guarantees reliability, durability and optimum operating qualities of buildings and installations.

Normative documents are constantly undergoing development and refinement. This affords an annual saving of 350-400 million rubles in construction and conservation of a sizable quantity of physical, labor and fuel-and-energy resources. For example, in 1981 new norms were adopted for the design of steel fabrications and important changes were made in the norms governing the design of reinforced-concrete fabrications. The norms furnish a classification of buildings and installations with respect to their relative importance, reliability

coefficients have been revised, and calculated resistances have been raised. The transition of the production of reinforced-concrete and steel fabrications to the new normative requirements, the calculations show, will make it possible even in the current 5-year period to reduce the consumption of rolled metal products by 1.2 million tons and consumption of cement by 2.3 million tons per year.

A set of measures has been developed and incorporated into the norms for reducing cement consumption--this involves the transition to a statistical method of monitoring concrete strength, raising the scaling coefficient in the testing of 100 x 100 x 100 mm control cubes, and raising the accuracy requirements as to the shapes of the control cubes. According to calculations of the Scientific Research Institute of Concrete and Reinforced Concrete and the All-Union Scientific Research Institute of Off-Site Technology of Prefabricated Reinforced-Concrete Fabrications and Products, the introduction of these measures will make it possible to conserve 8-10 percent on cement, which amounts to about 10 million tons a year. The list of such examples could be extended.

At the same time there are also important shortcomings in the present system of normative documents, the principal ones being the bulkiness and abundance of normative documents and of their various types. Normative documents contain not only basic principles, but also auxiliary and subsidiary material. The system does not embrace all aspects of norm setting. There is no clear-cut delineation of subject matter for the setting of norms and standards. The norms governing project planning of production processes are not sufficiently linked to the norms governing construction project planning. In addition to the normative documents there are also a large number of manuals and recommendations in effect which are widely used in project planning and construction. These documents are worked out by scientific research and project planning organizations without plan, they are not subsequently revised, they are not brought into conformity with the normative documents, and in a number of cases they contain outdated or abolished requirements. For instance, there are 18 normative documents and 16 manuals and recommendations in effect concerning the project planning and production of reinforced-concrete fabrications. As a check has shown, some of them contain certain requirements which contradict the norms.

Speeding up the pace of scientific-technical progress, a higher level of scientific research, extensive use of the capabilities of electronic computers, and higher skills of project planners and builders necessitate further improvement of the present system for setting technical norms and standards.

The direction of this improvement has been set forth straightforwardly in Decree No 312 of the CPSU Central Committee and USSR Council of Ministers dated 30 March 1981 and entitled "On Measures To Further Improve Project Planning and Cost Estimation." That decree calls for simplification of the system for setting technical norms and standards, reduction of the number of types of normative documents, elimination of duplication within them and unjustified detail, creation of the necessary conditions which make it possible to speed up treatment in normative documents of the results of completed scientific research projects and conditions that avoid restricting the creative initiative of project planners.

Improvement of the system for setting technical norms and standards should embrace all stages of the drafting, introduction and enforcement of norms and standards. Scientific research and summarization of the progressive know-how in project planning and construction always precedes the issuance of new normative documents or amendment of existing ones. Moreover, the major problem which could influence a substantial reduction of materials intensiveness, labor intensiveness and energy intensiveness of construction, a reduction of project construction time, and improvement of the quality of construction work should be worked on first. The results of these developments should be reflected in normative documents; then they become binding for application in project planning and construction.

Unfortunately, this is not always done. In a number of scientific research organizations the drafting of norms is regarded as a time-consuming job and sometimes they are satisfied with merely reporting on completed projects, and the reports are not thereafter applied in practice. Not uncommonly topics whose reflection in the norm is urgently demanded by everyday construction practice remain outside the field of vision.

For instance, various methods of determining soil pressure on pipe used in the project planning of pipelines give results that differ considerably from one another. The normative documents do not furnish requirements which determine use of a uniform method for taking into account soil pressure on pipes. The reason for this is the lack of the necessary experimental data making it possible to bring the computational principles and theoretical premises into conformity with the actual conditions of the service of pipe in the soil.

Because the anticorrosion protection is imperfect, the calculated service life of underground installations is between one-third and two-thirds lower than under normal service conditions. Drainage pipe networks of steel pipe which have been built and newly installed are in an especially problematical situation; in a number of cases they break down after 2-4 years of service.

The requisite scientific research has not been done, and as a consequence the normative requirements for project planning and construction do not exist for installations providing protection against mud slides, avalanches and landslides, for the waterproofing of underground parts of buildings and installations, for environmental protection and a number of other areas.

Recently the Collegium of USSR Gosstroy examined and approved a new system of normative documents in construction. This document provides for creating a unified system of normative documents for engineering surveys, project planning, construction and service. The system embraces all documents subject to approval of USSR Gosstroy and USSR ministries and departments jointly or in agreement with USSR Gosstroy, councils of ministers of union republics and gosstroys of the union republics, and state supervisory agencies.

It provides that normative documents shall include only basic principles ensuring reliability of fabrications, buildings and installations and a faster pace of technical progress in construction. For purposes of standardization only two types of normative documents are to be established--state standards (GOST) and construction norms and rules (SNiP).

In order to eliminate unjustified technological requirements which complicate and raise the price of the construction part of project plans, it provides that the norms governing the project planning of the production process are subject to clearance by USSR Gosstroy. It is provided that combined norms for project planning of construction work and the production process may be devised for certain sectors and branches.

It provides that organizations drafting normative documents must check the normative documents in effect which they have drafted at least once every 5 years to determine their scientific-technical level and if necessary draft recommendations for updating the documents.

Changes in construction norms and rules are submitted for approval of USSR Gosstroy once a year as a rule--in September, and they take effect as of 1 January of the following year.

It provides that ongoing supervision over compliance with requirements of normative documents is to be exercised by organizations and enterprises concerned with project planning, engineering surveys and construction, while spot checks are to be made by USSR Gosstroy, ministries, departments and gosstroyes of union republics in accordance with plans annually set forth by USSR Gosstroy.

The new system provides that scientific research, project planning and construction organizations and their responsible personnel shall be responsible for the correctness and technical soundness of the normative documents they draft and also for their enforcement in accordance with legislation in effect.

Interrelationship of the construction norms and rules is established with state standards and CEMA standards, as well as with manuals. The latter are drafted to supplement the normative documents, they state certain of their principles in more detail, they contain sample computations and algorithms, test tables, graph figures and other auxiliary and reference materials necessary for project planning and construction.

The manuals should be drafted and issued by the leading organizations which are drafters of normative documents according to plans set forth by USSR Gosstroy, which shall also set forth the list of those organizations. It provides that organizations drafting and issuing manuals shall be responsible for their technical and economic soundness, shall annually check the correspondence of those manuals to the normative documents in effect and to the level of science and technology, and shall determine the need for them to be updated or withdrawn.

Organizations which have found more effective solutions than those contained in the manuals shall apply them on their own responsibility.

Division of the documents into compulsory (normative) and recommendatory will make it possible to furnish project planners and builders the normative, auxiliary and informational materials they need for their work and create conditions for developing creative initiative aimed at reduced cost and materials intensiveness, shorter construction time and improved quality of construction.

Reduction of the number of types and the size of normative documents will make it possible to eliminate cases of duplication and will make the documents more lasting.

The linkage of norms governing construction and the project planning of the production process, provided for by the new system in order to eliminate unjustified technological requirements tending to make the construction part of projects more complicated and extensive will have a large economic benefit. For all practical purposes this work has already begun. In March of last year standard loads from production equipment were established for multistory buildings in 16 branches of industry by USSR Gosstroy on the basis of development work done by the Central Scientific Research and Experimental Design Institute of Industrial Buildings and Installations. These norms have been cleared with the respective ministries and establish loads between one-half and two-fifths as high as those which were unjustifiably applied previously on the basis of assignments of process engineers. The restriction on the loads which has been established guarantees that consumption of rolled metal products will be reduced by 120,000 rubles and money outlays by 50 million rubles a year in the branches under consideration alone.

The new system of normative documents is to be introduced on a planned basis. Projects which have the greatest influence on the technical-and-economic efficiency of construction will be carried out first of all.

The drafting of measures to improve the supply of normative documents to project planning and construction organizations deserves serious attention. At present cases are not uncommon when normative documents are issued only a year or more after they have been approved, and in 2 or 3 months they become a bibliographic rarity.

USSR Gosstroy, jointly with the State Committee for Science and Technology, USSR Goskomizdat [State Committee for Publishing Houses, Printing Plants and the Book Trade], and interested ministries and departments, is outlining a system of measures aimed at prompt and complete supply to organizations of newly drafted and approved normative documents as well as prompt delivery to them of changes and supplements to normative documents issued previously. Provision is being made for creating conditions for free access of interested organizations and specialists to library holdings of normative documents made up on a regional basis in the largest scientific-technical libraries, institutes for scientific-technical information (RINTI), as well as in a number of regional intersector centers for scientific-technical information and popularization (TsNTI) of the State Committee for Science and Technology.

The holdings of these libraries will be made up through the system of signal information of the All-Union Scientific Research Institute for Information on Construction (VNIIIS) of USSR Gosstroy. A list of organizations and the arrival of newly issued normative documents will be regularly reported in STROI-TEL'NAYA GAZETA.

The second direction for improved supply to interested organizations is to be the mandatory creation of a holding of normative documents in every scientific

research, project planning and construction and installation organization. The system worked out for free access to the holdings of normative documents in base organizations and also the mandatory creation of a holding of normative documents in every organization ought to substantially improve the system whereby normative documents reach the consumer.

Performance of measures to improve the system of technical norm setting in construction will become one of the factors in carrying out the decisions of the 26th CPSU Congress concerning further improvement of the state of affairs in capital construction.

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CONSTRUCTION PLANNING AND ECONOMICS

COMPUTER ANALYSIS OF CONSTRUCTION BOTTLENECKS ADVOCATED

Minsk SOVETSKAYA BELORUSSIYA in Russian 5 Feb 83 p 2

[Article by P. Luk'yanov: "And Then the Computer Intervened"]

[Text] Those who are directly involved with performance of economic tasks know that conditions for conduct of economic activity have become more complicated in recent years. The list of factors which have to be taken into account in planning the operation of one sector or another and indeed of production as a whole has been noticeably lengthened. They include the shortage of labor resources, the greater complexity of relations in the national economy, the fuel and energy problem and the transportation problem, and they also include the justified tightening of requirements for environmental protection. The problem has arisen in the major cities not only of restriction of new construction, but also the removal of existing enterprises from residential zones.

All of this has to be taken into account even in the preplanning stage, before one starts to compile the capital construction program, which determines what is to be built where and when, what is to undergo reconstruction, and what is to be altogether renounced.

Once the new factors have become involved, in order to "react" in good time one must know as much as possible about them, if not everything. In other words, a more abundant information base is needed for planning and recording capital investments. Why? So the different versions of the capital investment plan can be worked out thoroughly and comprehensively and the optimum version chosen. So that useful pressure can be put on clients and contractors by means of financial and credit instruments, economic incentives and penalties. And so that plans are detailed from top down and their fulfillment is closely monitored.

Promptly and operationally. But how is one to cope with the larger stream of figures? How to simplify the information, to learn how to tame it quickly? It is not, of course, possible to do without the use of electronic computers, modern communications equipment and systems for documentation and data gathering.

These were precisely the points of departure of specialists of the Belorussian republic office of USSR Stroybank when 4 years ago they undertook to set up the data base of "Technical-and-Economic Indicators of Construction Sites." They devised a document for gathering information on construction sites in all stages--from the project plan to bringing facilities up to rated capacity. Each construction site was given a code number, and the whole diversity of information about it was stored in the computer memory. Moreover, the computer itself checks the reliability of the figures.

Experimental use of the base began in 1982. If it was necessary, say, to obtain information on how construction was going by cities, or what the situation was in construction organizations, or how deadlines for construction of projects were being met, requests are put to the computer; it shares the extensive knowledge stored in its memory. It takes the YeS-1022 computer 30 minutes to furnish information on 5,000-6,000 construction sites. Even the most resourceful sports commentator could not even dream of this kind of "gift of the gab."

And what benefit comes from this? some reader will ask. The computer helped in making a comprehensive assessment of capital construction plans. Analysis of the information obtained revealed deep trends.

Now the problem of the shortage of manpower is being discussed everywhere, proposals of all kinds are being advanced on how to overcome it. Using the data stored in the memory, the Stroybank specialists calculated what the need would be for labor resources at the production enterprises now under construction and found that after they were put into service the number of workers required would exceed by almost 1.5-fold the anticipated growth of manpower. And in certain regions this growth would be between one-half and one-fourth of what the plants and factories under construction would need. Which means that the shortage will get worse. There was something to think about! The figures issued a direct appeal to the effect that the share of enterprises undergoing construction without increasing the size of the work force had to be sharply increased and a number of new industrial construction projects decreased just as sharply.

Whom do we usually scold for protracted construction time? The builders, of course, we say, are not working as they should. But are they always to blame? Let us ask the computer, which is not biased. Here is its unemotional, but objective response: The lag behind the allowed construction times was caused in 11 percent of the cases by failure to make appropriations, in 67 percent by reduction of annual plans for construction projects to be carried over as compared to the original plans, and by 23 percent by nonfulfillment of plans by construction organizations.

As we see, often the builders are in fact to blame, but protracted construction is mainly brought about by shortcomings in planning. Clients try with all their might to get as many projects going as possible, and then it turns out they cannot afford it all. The contractors have already taken credit from the bank to build these projects because the clients were short of funds, and consequently, they are forced by the nonfulfillment of plans to pay a higher rate of interest on this credit and to lose profit and bonus funds.

The builders' main troubles begin with unrealistic plans. Now that they have a full and accurate picture, the specialists of Stroybank can be more confident in achieving internal consistency between plans and the capacities of construction contractors. Interesting work is being done in this direction by the Gomel Oblast office of USSR Stroybank. In recent years it has originated many proposals which have made the activity of construction contractors easier. For example, the "Pareks-3" installation, which was not covered by the capabilities of the contractor, was omitted from the plan of the client and the No 6 Trust of "Mozyr'neftekhimstroy." For the same reason construction of a complex near completion at the Zhlobin Artificial Fur Factory was omitted from the plan of Trust No 40, which was recently formed and had not yet developed its capability, and was turned over to the stronger Trust No 20 of BSSR Ministry of Industrial Construction.

When the plans for 1983 were under consideration, the Gomel financial experts made 15 or so proposals concerning revision of the programs of construction trusts.

The need has arisen to furnish more effective aid to the contractor in other circumstances as well. For example, in cases of credit financing for overfulfillment of plans. That kind of credit is granted with the sponsorship of ministries, but the procedure for obtaining it is lengthy. That same Trust No 20 is building the Svetlogorsk Pulp and Paper Mill. New capacities are to be introduced in 1983. If this was to be done without excessive strain on energies, construction and installation work had to be done in 1982 not for 500,000 rubles, as planned, but for far more. The contractor was willing, but the client did not have the money. USSR Ministry of Timber, Pulp and Paper, and Wood Processing Industry had to sponsor the idea of credit financing for overfulfillment of the plan with USSR Stroybank. As a rule such questions are not dealt with as they arise. But the contractor must make settlement twice a month for materials and pay wages to the work force. It has to have resources, and local institutions of Stroybank do not have the right to extend credit to finance overfulfillment of plans.

The conclusion is suggested in and of itself: A more beneficial and responsive procedure needs to be established for issuing this kind of credit. Otherwise, what is the result? In 1983 the customer will have the money, but the contractor's capabilities will prove to be overloaded, and the necessary partial completion will not be in existence at the construction site. As for construction projects for nonproduction purposes, sources of money to finance overfulfillment of plans have not been identified at all for them. Yet initiative also needs financial backing.

Once again they put the question to the computer: Which construction sites have the "longest beards"? The computer replied: The greatest increase of construction time is observed at projects with an estimated cost under 3 million rubles, and there is moreover a clear functional relationship: construction time increases against the time allowed as the estimated cost gets lower. For instance, projects costing less than 500,000 rubles take 2.8-fold longer than the standard time allowed. This is where the funds are being squandered! This is where concern has to be shown about concentrating resources!

The possibilities for analyzing capital construction plans on the basis of the data base are truly inexhaustible. The input document calls for 54 qualitative characteristics of every construction site. In addition, the quantitative information read into the computer will make it possible to obtain production data. This increases the number of possible characteristics to 1,000.

Finally, we need to speak about one other possibility which the data base has opened up. The principles of its development and its software can be used to set up a unified comprehensive system "accounting--forecast--draft plan--plan--breakdown of the plan--followup on fulfillment." And there is no necessity whatsoever to store the information at one computer center. The collective network of computer centers of the Central Statistical Administration, Gosplan, and ministries and departments makes it possible to create an efficient system for exchange of information among all participants in the investment process by exchanging packages of magnetic tape disks.

Finally, a unified methodology of accounting and planning is needed here. At present the statisticians have their own set of reporting, the financial people another, and the planners their own, and so on. In spite of the abundance of information contained in reports and plans, with respect to many of the most important questions it is not possible to obtain specific calculations. Moreover, often a great deal of time has to be spent obtaining even indirect data. That is why it is so necessary to have a fund of indicators that is the same for everyone.

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CONSTRUCTION MACHINERY AND EQUIPMENT

CONSTRUCTION, ROAD MACHINE BUILDING GOALS OUTLINED

Moscow STROITEL'NYYE I DOROZHNYYE MASHINY in Russian No 1, Jan 83 pp 1-2

[Article by R. S. Masgutov, chief, Economic Planning Administration of the Minstroydormash: "Objectives of Construction, Road and Municipal Machine building in 1983"]

[Text] Having broadened the socialist competition for an honorable welcome to the 60th anniversary of the USSR's formation, the collectives of the production associations, enterprises and organizations of the Minstroydormash [USSR Ministry of Construction, Road and Municipal Machine Building] insured further development of the sector's economy and fulfillment of the main quotas of the State Plan for the USSR's Economic and Social Development in 1982.

The plan for the standard net production volume was fulfilled by 101.6 percent, the plan for commodity production was fulfilled by 100.5 percent and the product sales plan was exceeded by 27 million rubles.

Practically the entire increment in production volume was achieved through growth in labor productivity.

The profit plan was satisfied. The quota for the proportion of top-quality products within the total volume of standard net production was fulfilled by 111 percent.

The product assortment was updated. During the year, 95 obsolete forms of products were removed from production and 72 new highly productive models were placed into production.

The positive results of work in 1982 are primarily owing to the tremendous creative labor of the laborers, engineers, technicians and white collar workers, and of the multifaceted activities of the party and social organizations of the associations and enterprises.

Continual growth in production of sophisticated equipment by the Minstroydormash made it possible to basically complete full mechanization of the most difficult and laborious earth-moving, installation, finishing and other jobs in construction, as well as the main forms of jobs in logging and peat digging.

However, the demand of consuming sectors for the resources with which to mechanize all jobs is not being satisfied completely yet. As a consequence the ministry is

faced by a number of urgent problems. On one hand it must increase the production volume of machines, equipment and mechanized tools that are presently in production, while on the other hand it must create new machines and initiate their production quickly.

The State Plan for the USSR's Economic and Social Development in 1983 approved quotas for the Minstroydormash foreseeing predominant growth in the production volume of the most productive machines and equipment, ones that predetermine technical progress in the consuming enterprises, and mainly in construction. The annual production volume of associations and enterprises of the Minstroydormash will be 4.315 billion rubles.

The 1983 plan calls for production of 36,270 single- and multibucket excavators, 42,620 bulldozers, 9,150 scrapers, 6,150 graders, 250 pipelayers, 6,000 loaders, 15,040 truck-mounted cranes, 920 pneumatic-tire cranes and cranes mounted on special chassis, 2,420 tower cranes with loading capacities of 5 tons and more, 55 track-mounted cranes with loading capacities of 63-100 tons, 19,400 tons of production equipment for cement industry, 103,000 tons of equipment for production of reinforced concrete structures, 141.5 million rubles worth of production equipment and spare parts for logging and rafting operations, 43.1 million rubles worth of equipment for peat industry, 2,581,400 units of mechanized construction tools, 431,600 units of construction-finishing machinery, 20,942 elevators, 269,000 fans, 20,417 units of machinery for city maintenance, 6,800 fire trucks, more than 270 million rubles worth of spare parts for machines and equipment and 150 million rubles worth of cultural, personal and household goods, in retail prices.

There are plans for manufacturing, and delivering to agriculture, not less than 20,000 excavators, 21,500 bulldozers, 9,300 scrapers and 1,300 graders in 1983. The Bryansk Road Building Machine Plant will initiate production of five outfits of DS-150 machines for high-speed construction of local motor roads.

The new equipment plan for 1983 foresees creation of 145 experimental models and assimilation of 151 new forms of industrial products. An extensive amount of work is to be done in 1983 with the purpose of dramatically increasing the technical level and quality of products.

One of the main directions for raising the technical level of machines, reducing their weight and increasing labor productivity is, as before, transition from mechanized to hydraulic drive.

This highly important problem requires a dramatic increase in production of hydraulic drive components by enterprises of the "Soyuzstroygidromash" All-Union Production Association: pumps, motors, filters, cylinders and distributors. Further unification of these components is also needed. The production volume of standard and automatic hydraulic drives will increase by 13 percent in 1983.

The 1983 plan foresees accelerating growth of the production of the most progressive machines. The Kalinin Order of the Red Labor Banner Excavator Plant will increase production of EO-3323 hydraulic excavators with a bucket capacity of 0.63 m³, the productivity of which is 30 percent higher than of excavators having buckets with

a capacity of 0.4-0.5 m³. They will be outfitted with a broad assortment of interchangeable working equipment and working elements (about 20 different kinds), to include a back hoe with an elongated arm for land reclamation operations, shaped buckets of different configurations, suspended drilling equipment, a hydraulic hammer, a tamper, a hydraulic clamshell, grabs and others.

The Korvov Order of Lenin Excavator Plant will produce 350 EO-4124 caterpillar tractor excavators.

The Voronezh Excavator Production Association imeni Komintern is planning to manufacture 900 hydraulic excavators with a bucket capacity of 1.6 m³.

The Sterlitamak Construction Machinery Plant plans to manufacture 250 TG-502 pipe-layers with a loading capacity of 50 tons, while the Chelyabinsk Order of Lenin Road Machinery Plant imeni Kolyushchenko will produce 400 heavy 250 horsepower (184 kw) graders.

One of the important assignments of the 1983 plan is production of two composite lines and assimilation of the production of domestic lines for production of cement-wood chip panels at the Mogilev Order of the Red Labor Banner "Strommashina" Plant.

High-performance machinery for land reclamation construction is to be produced in 1983: MK-21 bank levelers mounted on T-130BT tractors, MK-23 channel diggers, an outfit of equipment to build unexposed irrigation systems for 200-400 mm and 500-1,200 mm piping, and MD-4 and MD-5 drain pipe layers for laying drain pipes without a trench.

Efforts will be continued to assimilate production of LP-49 felling-skidding machines mounted on TT-4 tractors and possessing a hydraulic manipulator and a felling-cutting device. Their production will increase to 170 units. Four hundred LP-33 self-powered pruning machines will be manufactured. Production of LO-15S semiautomatic bucking lines will increase, and manufacture of high-capacity LT-170 wood chip carriers with a 70 m³ bed volume mounted on a KRAZ-258 chassis will be started.

The production volume of all kinds of mechanized tools is to be increased to 2.58 million units, and that of construction-finishing machines is to be increased to 431,600 units in 1983.

The Volzhsk Order of the Red Labor Banner "Vologotsemmash" Cement Machine Building Plant will continue its efforts to assimilate production of tracked cranes with a loading capacity of 63-100 tons, while the Drogobych Truck-Mounted Crane Plant plans to manufacture 550 KS-3575 hydraulic cranes with a loading capacity of 10 tons and a rigidly mounted telescopic boom.

All machines now being assimilated are on par with the best world models in terms of their technical and operational characteristics.

The average indicators for the most important kinds of products will be greater in 1983 than in 1982:

The average capacity of the buckets of single-bucket excavators will increase from 0.46 to 0.48 m³, while machine life will increase from 6,500-9,500 to 6,800-10,200 hours;

the average capacity of scraper buckets will increase from 4.2 to 4.5 m³;

the average power of graders will increase to 116.3 horsepower (85 kw).

Fifty-eight articles are to be certified for the State Seal of Quality, and the proportion of top-category products with respect to total production volume is to be increased to 31.5 percent. This includes 33 percent for single-bucket excavators, 28.6 percent for graders, 31 percent for truck-mounted cranes and 53 percent for tower cranes.

One of the most important measures in support of the 1983 plan is to fulfill the assignments of the specific-purpose integrated program of enterprise reequipment, which calls for introducing progressive production processes, fully mechanized operations for the production of castings, forgings, stampings and welded structures, and mechanization of assembly and other kinds of jobs. There are plans for fully mechanizing 73 shops and sections and introducing 54 mechanized, automatic and semiautomatic lines and 679 units of high-productivity and specialized equipment, to include 170 machine tools equipped with digital programmed control.

Implementation of the planned measures will raise the mechanization level of labor to 62.5 percent, convert the manual labor of 2,910 workers to mechanized labor and conditionally free 8,000 persons.

The most important objective of the 1983 plan is to complete the sector's "Economy" specific-purpose integrated program. The plan calls for reducing the norms of rolled metal expenditure by 4.2 percent and saving 81 million kilowatt-hours of electric power and 35,000 gigacalories of thermal power. What the production collectives and the planning and technological institutes must do is insure unconditional fulfillment of these quotas, so that the approved plan could be surpassed by economizing on materials while maintaining the prescribed product assortment.

Fulfillment of the 1983 plan will require hard work from the collectives of all of the sector's enterprises and associations, and it will be a substantial contribution to fulfilling the decisions of the 26th CPSU Congress and completing the assignments of the USSR Food Program.

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CONSTRUCTION MACHINERY AND EQUIPMENT

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PLANTS TASKED TO INCREASE HAND TOOLS OUTPUT

Moscow STROITEL'NYYE I DOROZHNYYE MASHINY in Russian No 1, Jan 83 pp 17-18

[Article by V. V. Popov, chief, "Soyuzstroyinstrument" All-Union Production Association: "Small Mechanized Resources for Builders"]

[Text] Hand-held power tools and construction and finishing machines are the most effective resources for raising the productivity and reducing the proportion of manual labor in construction.

For example power screwdrivers and chipping and caulking hammers can raise labor productivity by 8-9 times, while grinders, scrapers, drills and thread cutting machines can raise productivity by 5-7 times. One such machine can produce an annual savings that exceeds its cost by several times.

Use of vibrators to compact poured concrete raises labor productivity by 3-4 times. Vibrators are used with no less of an impact to unload bulk materials from hoppers and transportation resources, to knock castings out of mold frames, to conduct vibration tests and so on. Modern construction would be unimaginable without the use of highly productive, dependable and easily operated hand tools.

It would be difficult to overstate the effectiveness of pneumatic punches used for laying underground utility lines without the need for digging trenches. Use of pneumatic punches not only raises labor productivity but also insures maintenance of the integrity of road pavement and structures beneath which utility lines are laid. As introduction of these machines into the national economy broadens, the sphere of their application widens. For example pneumatic punches are now starting to be used in conjunction with installation of monolithic reinforced concrete piles.

Painting and plastering stations, high-pressure paint sprayers and plaster mixers have been designed and are now in series production. This will mean full mechanization of painting and plastering jobs.

In the Minstroydormash [USSR Ministry of Construction, Road and Municipal Machine Building], mechanized tools and finishing machines are being manufactured by enterprises of "Soyuzstroyinstrument" All-Union Production Association. These enterprises produce almost 90 percent of all hand-held power tools and about 100 percent of the construction and finishing machines manufactured in the USSR.

This sector came into being and underwent development only in the postwar era for practical purposes. During this time a modern scientific-technical base was created. New plants grew in many union republics. They include the the Rezekne "Elektrostroyinstrument" Production Association imeni XXIV s"yezd KPSS and the Daugavpils "Elektroinstrument" Plant in the Latvian SSR, the Vilnius "SOM" Production Association in the Lithuanian SSR and the Nazran "Elektroinstrument" Plant imeni Gapur Akhriyev in the Chechen-Ingush ASSR. Plants are operating in Moscow, in Rostov-on-Don, in Odessa and in Tursun-Zade, Tajik SSR. Construction and finishing machine plants have gone into operation in Volkovysk in the Belorussian SSR and in Dneprorudnoye in the Ukrainian SSR.

The entire sector participated in the creation of the new plants. Planning organizations of the RSFSR, Belorussian SSR, Ukrainian SSR and other union republics took part in the planning and construction. Specialists of the RSFSR and the Lithuanian SSR helped their Belorussian and Ukrainian colleagues to assimilate the new production.

Each year the sector's plants produce 204 type-sizes of hand-held power tools and construction and finishing machines, and 139 type-sizes of hand tools. Just in the 10th Five Year Plan the production volume of electric and pneumatic hand-held power tools increased by 24 percent, reaching 2,970,000 units in 1980, while the production volume of construction and finishing machines grew by 17 percent, attaining 735,000 units.

Machinery production will enjoy further development in the 11th Five Year Plan. There are plans for increasing machine production by 30 percent.

Each year 20-25 new articles are placed into production, machinery currently in production is modernized, and the effectiveness, quality and reliability of the machines is increased. The products of the association are on par with the best world models.

Production of small mechanized resources and hand construction tools is organized on the basis of specialization and broad cooperation of production owing to a high degree of unification of the parts and units of machines, with a consideration for using progressive manufacturing procedures.

Production of electric hand-held power tools with double insulation has now been assimilated. This has necessitated complete reorganization of the production lines of the sector's enterprises. They were outfitted with special equipment to produce double-insulated electric motors and with automatic thermoplastic machines for manufacturing polymer parts. Procedures were assimilated for molding complex body parts out of polymers and manufacturing complex molds, and methods have been developed for testing the electrical safety of machines. In parallel, the commutator drive of electric hand-held power tools was improved.

As a result the life of a large number of series-produced articles was increased by 2.5 times--electric and pneumatic impact wrenches, power grinders and drills, and construction and finishing machines. This also promoted introduction of original test benches and measuring apparatus for quality control at all stages of production and for comprehensive testing of finished articles. The plants are making extensive

use of highly productive automated multiposition test benches for testing reliability.

The quality and reliability of the articles produced will be improved by expanding the use of new effective materials and production processes. For example polymers and the methods of powder metallurgy will enjoy broader introduction. An intensive effort is being made to introduce plastics into the production of pneumatic hand-held power tools. Production of pneumatic power drills with an all-plastic body has been assimilated. Plastics are being extensively introduced into the production of construction and finishing machines and construction hand tools. Plastic is being used in particular to manufacture critical parts such as the diaphragms of high-pressure pumps for airless paint sprayers.

The latest production equipment and methods used to heat-treat polymer parts and check their quality have been introduced into production. All of this has had a positive effect on the quality of hand-held power tools and finishing machines.

Broad use of hand-held power tools in the national economy has created a new socioeconomic and scientific-technical problem--that of reducing vibrations created by hand tools and transmitted to the hands of the operator. This problem, one dictated by the very nature of the socialist structure--by concern for the health of laborers--was posed for the first time in the world. It was solved successfully, resulting in a significant savings of materials and practically excluding the possibility of vibration disease among operators of hand-held power tools.

Fundamentally new vibration-safe pneumatic chipping, caulking and riveting hammers and electromagnetic and electromechanical hammers and punches were created and placed into series production in extremely short time. Vibration-safe impact wrenches, created for the first time in the world, permit calibrated tightening of high-strength threaded couplings. Such wrenches are much more effective and lighter than similar articles produced by the leading foreign companies, and they insure precise tightening without the need for subsequent manual control. Practically all hand-held power tools produced today by the sector's plants have a vibration-safe design, and what is no less important, they are equipped with highly effective noiseproofing systems.

At the beginning of the 11th Five-Year Plan the Rostov "Elektroinstrument" Production Association assimilated series production of electric drills with an electronic system for controlling the rotation rate of the spindle. These machines, which enjoy broad applications, can be used to drill through various materials under optimum conditions. The first consignment of such machines was produced using imported regulators. Work is now being finished on the design of domestic electronic regulators equipped with feedback. They will be installed in machines presently in production.

In 1982, the jubilee year, builders received a new original mechanized tool. This is multipurpose IE-4713 electric punch, used to install pins securing various kinds of equipment to concrete, reinforced concrete and other

construction structures. Builders have also received pneumatic staple and nail guns manufactured by the Vilnius "SOM" Association. These hand-held power tools will be useful primarily to rural builders, which will have a favorable effect on fulfillment of the USSR Food Program.

Machines have been designed and are now being produced for all kinds of finishing jobs--plastering, painting, roofing and floor finishing. They include piston and screw mortar pumps and plastering units, mobile plastering units for work in upper stories, compressors, paint pressurizing tanks and pneumatic sprayers. Production of airless high-pressure paint sprayers has been assimilated. Painting done with such sprayers is highly productive, the painting quality is excellent, and paint is used very economically.

Moveable plastering and painting stations--unique plants on wheels--were created and placed into series production for the first time in the world. Plastering and painting jobs done with such stations are highly productive in all conditions, even in the most severe weather.

Outfits of machinery and equipment for full mechanization of roofing jobs are being produced in small series for the time being.

The efforts to mechanize floor-laying jobs have led to the creation and series production of floor polishers working off of both three-phase and one-phase current. Mosaic tile polishers and power-driven cement floats are in series production at the Odessa Construction and Finishing Machinery Plant. Once the planned output capacities of the Kostopol and Dneprorudnoye "SOM" plants are assimilated, series production of the entire complex of machinery for these purposes will begin.

In particular the Kostopol plant will produce systems that use a vacuum method to lay concrete floors. This method is especially suited to the laying of floors in large production buildings.

Production of outfits of mechanized resources and tools for installation of wall panels made from gypsum-cardboard wallboard has been assimilated. These resources include machines for preparing the panels and the metallic frames, securing wallboard to the frames, cutting holes for electric lighting fixtures and finishing the surface.

Machines manufactured by the sector have been earning the high praise of builders, installers and finish workers. The Olympic facilities erected in Moscow with the help of these machines are testimony to their quality. Experimental machine models underwent their first serious test at the largest construction sites of the national economy (the Kama Motor Vehicle Plant, the Baykal-Amur Rail Trunkline and elsewhere).

New models of machines and tools developed by the "VNIISMI" Scientific-Production Association are being tested right at the workplaces on the basis of contracts of creative cooperation signed with a number of construction organizations, particularly with brigades led by heroes of socialist labor comrades

A. M. Surovtsev and N. A. Zlobin. This form of cooperation is providing invaluable information to the developers, permitting them to continually improve their products.

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